

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

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1. REPORT DATE (DD-MM-YYYY)	2. REPORT TYPE	3. DATES COVERED (From - To)		
Technical Paper				
4. TITLE AND SUBTITLE		5a. CONTRACT NUMBER		
Please see attached		5b. GRANT NUMBER		
		5c. PROGRAM ELEMENT NUMBER		
		5d. PROJECT NUMBER 1011		
6. AUTHOR(S)		5e. TASK NUMBER 00VA		
		5f. WORK UNIT NUMBER 346242		
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)		8. PERFORMING ORGANIZATION REPORT Thickol		
Air Force Research Laboratory (AFMC) AFRL/PRS 5 Pollux Drive Edwards AFB CA 93524-7048		9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) 10. SPONSOR/MONITOR'S ACRONYM(S)		
		11. SPONSOR/MONITOR'S NUMBER(S) Please see attached		
12. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution unlimited.				
13. SUPPLEMENTARY NOTES				
14. ABSTRACT				
20030205 282				
15. SUBJECT TERMS				
16. SECURITY CLASSIFICATION OF:		17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT		A		Leilani Richardson
b. ABSTRACT				19b. TELEPHONE NUMBER (include area code) (661) 275-5015
c. THIS PAGE				
Unclassified	Unclassified	Unclassified		

MEMORANDUM FOR PRR (Contractor Publication)

FROM: PROI (TI) (STINFO)

02 March 2000

SUBJECT: Authorization for Release of Technical Information, Control Number: **AFRL-PR-ED-AB-2000-041**
Wassom, Steven R. (Thiokol), "Focus Control System for Solar Thermal Propulsion"

International Advanced Dynamics analysis Systems Conference (Statement A)
Orlando, FL, 19 June 2000 (Deadline 01 Mar 2000)
(Please expedite - Past Deadline!)

1. This request has been reviewed by the Foreign Disclosure Office for: a.) appropriateness of distribution statement, b.) military/national critical technology, c.) export controls or distribution restrictions, d.) appropriateness for release to a foreign nation, and e.) technical sensitivity and/or economic sensitivity.

Comments: _____

Signature _____ Date _____

2. This request has been reviewed by the Public Affairs Office for: a.) appropriateness for public release and/or b) possible higher headquarters review.

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3. This request has been reviewed by the STINFO for: a.) changes if approved as amended, b.) appropriateness of distribution statement, c.) military/national critical technology, d.) economic sensitivity, e.) parallel review completed if required, and f.) format and completion of meeting clearance form if required

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4. This request has been reviewed by PR for: a.) technical accuracy, b.) appropriateness for audience, c.) appropriateness of distribution statement, d.) technical sensitivity and economic sensitivity, e.) military/national critical technology, and f.) data rights and patentability

Comments: _____

APPROVED/APPROVED AS AMENDED/DISAPPROVED

LAWRENCE P. QUINN
Technical Advisor
Rocket Propulsion Division

DATE

Focus Control System for Solar Thermal Propulsion

Steven R. Wassom, Ph.D., P.E.

Thiokol Propulsion

Brigham City, UT

Solar thermal propulsion (STP) uses a parabolic concentrator like a large magnifying glass to focus the sun's energy and heat a working fluid such as hydrogen to very high temperatures (3,000 K). The hydrogen is then expelled through a nozzle to produce thrust. This innovative concept has twice the efficiency of currently used chemical upper stage propulsion systems. Inflatable solar concentrators can be packaged more efficiently than rigid concentrators of equal power. The Air Force Research Lab is sponsoring Thiokol Propulsion and SRS Technologies to design, build, and demonstrate an inflatable STP system. This paper will address the use of ADAMS and MATRIXx to develop the structure's focus control system, which uses an articulated mechanism to track the sun and focus the solar energy. Animations of the closed-loop 3-D models have been developed to show the feasibility of the concept.

